AF/1711

TRANSMITTAL LETTER (General - Patent Pending)	Docket No. 113298-00002

In Re Application Of: **Ishida et al.**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/646,849	October 17, 2000	M. Fletcher	29175	2837	1114

Title: **APPARATUS AND METHOD FOR JOINT MECHANISM, JOINT APPARATUS, AND ROBOT DEVICE AND CONTROL METHOD THEREOF**

COMMISSIONER FOR PATENTS:

Transmitted herewith is:

Appellants' Reply Brief (6 pages); Postcard.

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Dated: **October 26, 2004**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicants:	Ishida et al.
Appl. No.:	09/646,849
Filed:	October 17, 2000
Title:	"APPARATUS AND METHOD FOR JOINT MECHANISM, JOINT APPARATUS, AND ROBOT DEVICE AND CONTROL METHOD THEREOF"
Art Unit:	2837
Examiner:	M. Fletcher
Docket No.:	113298-002

Commissioner for Patents
Washington, DC 20231

APPELLANTS' REPLY BRIEF

Dear Sir:

I. INTRODUCTION

This reply brief is submitted in response to the Examiner's Answer mailed August 26, 2004, pursuant to 37 C.F.R. § 1.193(b)(1). Appellants respectfully submit that the Examiner's Answer has failed to remedy the deficiencies with respect the Final Office Action date July 30, 2003 as noted in Appelant's Brief filed on June 2, 2004 for the reasons set forth below. Accordingly, Appellants respectfully request that the rejections of the pending claims be reversed.

II. THE COMBINATION OF ONAGA ET AL. WITH *TSAI ET AL.*, *VILLARET* AND *TAKENAKA ET AL.* FAILS TO TEACH OR SUGGEST EVERY ELEMENT OF THE CLAIMED INVENTION AS A WHOLE

The Examiner has admitted that "*Onaga et al.* do not teach the actuator including a current detector, a torque detector, and control means" (Examiner's Answer page 6, second

paragraph). The Examiner then relied on the *Tsai* to submit that the reference discloses "an actuator (2 and 3) including control means as well as current (inherent) and torque detectors as discussed in column 9, lines 3-19 and as seen in figure 3" (Examiner's Answer page 6, third paragraph). However, a closer examination of this passage, as well the reference as a whole, shows that *Tsai* indeed does *not* teach the features as asserted by the Examiner.

In addition to the arguments put forth in pages 11-15 of Appellant's Appeal Brief, Appellants submit that the Examiner is misreading the above-referenced passage, which states:

> Two measurements are sufficient for the description of the state for this two-DOF RBR arm. Since actuators 2 and 3 drive joints 1 and 2 respectively, sensors are placed on actuators 2 and 3 to avoid the compliance problem associated with the first transmission line. The three actuators can be either dc-motors, stepper motors, brushless dc-motor or other type actuator whose torque is controlled by either a computer, a PD controller or PID controller.

(col. 9, lines 3-11). While the Examiner has apparently interpreted this passage to mean that the sensors are *physically* placed within actuators 2 and 3, the entire disclosure in *Tsai* demonstrates that this is not the interpretation contemplated by the reference, and there has been no evidence provided in the record that would indicate that one of ordinary skill in the art would interpret otherwise.

Specifically, the passage refers to having 2 sensors being responsible for sensing two of the three actuators (2 and 3), in order to allow the system to provide topological synthesis of articulated gear mechanisms. This is discussed in detail in *Tsai* in col. 4, lines 26-61. Having two sensors and three actuators, a structure matrix can be created to provide a redundant-drive backlash-free robotic mechanism (col. 4, lines 56-58). Under this configuration, the two sensors "avoid the compliance problem associated with the first transmission line" by conforming to the topological synthesis described above. While the Examiner has taken the position that the

"compliance problem" of *Tsai* refers to reducing wiring (see Examiner's Answer, page 7. last three lines), Appellants submit that the teaching in *Tsai* bears no relation to this position as the reference clearly demonstrates that the "compliance problem" is focused on synthesizing articulated gear mechanisms.

Furthermore, the context of FIG. 10 and associated text (col. 10, lines 25-27), makes apparent that the sensor/controller is not within the actuator itself, but is administered from a "universal", or external, vantage point. Indeed, it is critical to the teaching of *Tsai* that the sensing occurs universally (i.e., outside the actuators), as the invention relies on a homogeneous torque analysis to compensate for failing drives and to control backlash (col. 13 line 46 to col. 14, line 9). Accordingly, *Tsai et al.* does not teach or suggest actuators for moving robot joints which include electric current detectors, torque detectors and controllers within the actuators themselves as in the claimed invention.

Regarding the *Villaret* reference, the Examiner refers to servo controller 31 as an "actuator case" (see Examiner's Response, page 6, fourth-to-last line), however, there is nothing in the disclosure of *Villaret* that teaches or suggests this terminology. In fact, there is nothing in the disclosure of *Villaret* that defines servo controller 31 as an actuator (see Appellant's Brief page 14). To be sure, the specification of *Villaret* states that "sufficient current is fed by the actuators controlled by the SC, to produce equilibrating torques which prevent motion of the arms about their joints" (col. 4, lines 27-29; see also col. 3, lines 52-55). Consequently, it would be contrary to the explicit teaching of *Villaret* to re-define the SC as an actuator when the actuator has already been defined in the disclosure.

Furthermore, FIG. 3 is a system diagram of the block diagram of FIG. 2, illustrating the transfer functions occurring among the MTOC 32, Main Controller 30 and the SC 31 (col. 6,

lines 44-51). It is clear from the disclosure in *Villaret* that the system diagram of FIG. 3 is not illustrating the physical interconnection among the units as shown in FIG. 2, but is merely describing the routing of torque and position values among the units (col. 6, line 53 to col. 7, line 9). Just because signals are grouped together does not mean that the underlying hardware is physically grouped together as well. *Villaret* is explicit in teaching that only the MTOC and controlling units are capable of being integrated, as they all have complementary software/hardware functions with regard to one another (col. 4, lines 1-18, 33-39; col. 6, lines 48-51). There is no teaching or suggestion to combine or integrate the controllers with any other device. To this end, the Examiner has already conceded that the illustration of FIG. 2 shows that the elements are physically separate (Examiner's Answer page 8, lines 7-8).

Because the *Onaga et al.*, *Tsai et al.*, *Villaret* and *Takenaka* combination fails to teach or suggest every element of the claimed invention, the final rejection of claims 1, 3, 4, 6, 8, 9 and 11-30 is improper and should be reversed.

III. THERE IS NO TEACHING, SUGGESTION OR MOTIVATION TO COMBINE *ONAGA ET AL.* WITH *TSAI ET AL.*, *VILLARET* AND *TAKENAKA ET AL.* TO PURPORTEDLY ARRIVE AT THE CLAIMED INVENTION

Appellants respectfully submit further that the rejection of Claims 1, 3, 4, 6, 8, 9 and 11-22 under 35 U.S.C. §103 should be reversed because the Examiner has failed to show that there is any teaching, suggestion or motivation to combine the references in the manner suggested by the Examiner to cited references, alone or in any combination, teach and/or suggest each and every feature of the claimed invention as required by Claims 1, 3, 4, 6, 8, 9 and 11-22.

In addition to the arguments submitted in pages 7-11 of Appellant's Brief, Appellant submits that the Examiner's Answer demonstrates that there is no teaching, suggestion or

motivation to combine the reference in the manner suggested by the Examiner. As discussed above, the Examiner has posited that the combination of *Onaga et al.* with *Tsai et al.* and *Villaret* "would avoid the compliance problem with transmission lines as taught in *Tsai et al.* (column 9, lines 4-7) which provides less wiring" (Examiner's Answer page 7, last three lines). However, the "compliance problem" of *Tsai* has nothing to do with wiring, but instead deals with conforming a topological synthesis calculation for a redundant-drive backlash-free system – a feature that is wholly irrelevant to the teachings in any of the cited references.

With regard to *Villaret*, the reference teaches the use of a MTOC that is used in conjunction with a main controller and a servo controller to "learn" proportional displacement of equilibrating torques to maintain robotic arms at a final displacement position (col. 4, lines 19-32; col. 5, lines 31-47). *Villaret* teaches that the MTOC is used with conventional controllers (main controller, servo controller) in carrying out its operation (col. 6, lines 8-12). Notwithstanding the fact that the controllers are not included in the actuator, there is no teaching, suggestion or motivation for one of ordinary skill in the art to combine the MTOC configuration of *Villaret* with that of *Onaga et al.* or *Tsai et al.*

Due to the lack of any teaching or suggestion in the references themselves or within the general knowledge of those skilled in the art to combine the two references, the Examiner has not met his burden of establishing that the rejected claims are prima facie obvious under 35 U.S.C. §103, and the final rejection of claims 1, 3, 4, 6, 8, 9 and 11-22 should be reversed.

IX. CONCLUSION

Appellants respectfully submit that all of the pending claims are in condition for allowance over the art of record. The Examiner has failed to establish a *prima facie* case of

obviousness under 35 U.S.C. § 103(a) with respect to Claims 1, 3, 4, 6, 8, 9 and 11-22. Therefore, Appellants respectfully submit that the rejections of pending Claims 1, 3, 4, 6, 8, 9 and 11-22 is an error in law and in fact and should be reversed by this Board.

Respectfully submitted,

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